

may, I shall not stick to say that the Increase and Nourishment of all Plants is included in Water ; for let our barren and unfruitful Downs, that consist of a very fine Sand, be brought to such a Level that they lie but a foot higher than the Moats and Ditches round about them, so that the Rain water be not drain'd away as it falls, such Land shall not only produce good Grass, but even Rye, Barley, and several other Fruits.

III. *Some new Observations upon the parts and use of the Flower in Plants.* By Mr Sam. Morland.

THe nice and curious Texture of the Flower and its Furniture, obvious to common view, hath invited and employ'd the enquiries of many Learned and Sagacious Persons. But since these noble Searchers into the History and Operations of Nature, don't seem so happily to have reacht her design in this case as in many others, 'tis hop'd the Ingenious will not disdain a new attempt to account for the Fabrick and use of these parts ; whereby the propagation of Vegetables will be render'd more-intelligible, and the ways of Nature appear more harmonious, and of a piece. It hath been long ago observed, that there is in every particular Seed a Seminal Plant conveniently lodg'd between the two Lobes which constitute the bulk of the Seed, and are design'd for the first nourishment of this tender Plant.

But the admirable Dr Grew, to whose generous Industry and happy Sagacity we are indebted for the best improvements of this part of Knowledge, is the only Author I can find, who hath observed that the *Farina* (or fine powder which is at its proper Season shed out of those *Theca* or
Apices

Apices Seminiformes, which grow at the top of the *Stamina* doth some way perform the office of Male Sperm. But herein I think he falls short, in that he supposes them only to drop upon the outside or the *Uterus* or *Vasculum Seminale*, and to impregnate the included Seed by some spirituous emanations or energetical Impress.

That which is now subjected to the disquisitions and censure of such whose exquisite skill doth constitute them Judges of such Performances, is whether it be not more proper to suppose that the Seeds which come up in their proper *Involucra*, are at first like unimpregnated *Ova* of Animals ; That this *Farina* is a *Congeries* of Seminal Plants, one of which must be convey'd into every *Ovum* before it can become prolifick ; That the *Stylus* in Mr *Ray's* language, the upper part of the *Pistillum* in Mr *Tournefort's*, is a Tube design'd to convey these Seminal Plants into their Nest in the *Ova* ; That there is so vast a provision made, because of the odds there are, whether one of so many shall ever find its way into, and through so narrow a Conveyance.

To make this supposition the more credible, I shall lay down the Observations I have made upon the situation of these *Stamina* and the *Stylus* in some few species of Plants.

First, in the *Corona Imperialis*, where the *Uterus* or *Vasculum feminale* of the Plant stands upon the Center of the Flower, and from the top of this ariseth the *Stylus*, the *Vasculum Seminale* and *Stylus* together representing a *Pistillum*. Round this are planted six *Stamina*, upon the ends of each of these are *Apices* so artfully fixt that they turn every way with the least Wind, being in heighth almost exactly equal to the *Stylus* about which they play, and which in this Plant is manifestly open at the top, as it is hollow all the way. To which we must add, that upon the top of the *Stylus* there is a sort of *Tuft*, consisting of pinguid *Villi*, which I imagin to be plac'd there, to catch and detain the *Farina* as it flies out of its *Theca*. From hence

hence I suppose the Rain either washes it, or the Wind shakes it down the Tube, till it reach the *Vasculum Seminale*.

In *Capri folium*, or *Honey-suckle*, there rises a *Stylus* from the rudiments of a Berry, into which it is inserted to the top of the *Monopetalous Flower*, from the middle of which Flower are sent forth several *Stamina*, that shed their *Farina* out of the cases upon the orifice of the *Stylus*, which in this Plant is Villous or Tufted, upon the same account as in the former.

In *Allium* or *common Garlick*, there arises a *Tricoccoous Uterus*, or Seed Vessel, in the center of which is inserted a short *Stylus*, not reaching so high as the *Apices*, which thus overtopping it, have the opportunity of shedding their Globules into its orifice more easily. For which reason I can discern no Tuft upon this (as in the former) to insure their entrance, that being provided for by its situation just under them.

The Reader, I hope, will excuse me if I present him now with some such reasonings or reflections as the foregoing account doth suggest, and will support. And I can't but hope to persuade those that are candid, that I have assign'd to the several parts of the Flower I have mention'd their true and real use.

For nothing can be more natural than to conclude, that where a fine *Powder* is curiously prepar'd, carefully reposit-ed, and shed abroad at a peculiar season; where there is a Tube so planted as to be fit to receive it, and such care in disposing this Tube, that where it doth not lye directly under the cases that shed the Powder, it hath a particular *Apparatus* at the end to insure its entrance. Nothing can be more genuinely deduc'd from any premises than from this it may, that this *Powder* or some of it was design'd to enter this Tube. If these *Stamina* had been only excretory Ducts, as has been hitherto suppos'd, to separate the grosser parts, and leave the juice design'd for the

the nourishment of the Seed more reserv'd, what need was there to lodge these Excrements in such curious Repositories. They would have been convey'd any whither, rather than where there was so much danger of their dropping into the *Seed Vessel* again, as they are here.

Again, the *Tube*, over the mouth of which they are shed, and into which they enter, leads always directly into the *Seed Vessel*.

To which we must add, that the *Tube* always begins to dye when these *Thecæ* are empty'd of their contents; if they last any longer, it is only whilst the *Globules* which enter at their orifice, may be suppos'd to have finish'd their passage. Now can we well expect a more convincing proof of these *Tubes* being design'd to convey these *Globules*, than that they wither when there are not more *Globules* to convey.

If I could now show that the *Ova*, or unimpregnated Seed, are ever to be observed without this *Seminal Plant*, the proof would arise to a demonstration; but having not been so happy as to discern this, I shall recommend the enquiry to those Gentlemen who are Masters of the best Microscopes, and address in using them. Tho in the mean time, I have made some steps towards a proof of this sort, and have met with some such hints as make me not despair of being able, in a short time, to give the World even this satisfaction. For, not to insist upon this, that the *Seminal Plant* always lyes in that part of the Seed which is nearest to the insertion of this *Stylus*, or some propagation of it into the *Seed Vessel*; I have discovered in *Beans* and *Peas* and *Phaseoli*, just under one end of that we call the *Eye*, a manifest perforation (discernible by the grosser sort of Magnifying Glasses) which leads directly to the *Seminal Plant*, and at which I suppose the *Seminal Plant* did enter; and I am apt to think that the Beans or Peas which don't thrive, will be found destitute of it.

But I must now proceed to describe some other Plants, whereby it will appear, that there is a particular care always

exercis'd to convey this Powder, so often mention'd, into a *Tube*, which may convey it to the *Ova*. Now in *Leguminose* Plants, if we carefully take off the *Petala* of the Flower, we shall discover the *Pod* or *Siliqua* closely cover'd with an involving Membrane, which about the top separates into many *Stamina*, each fraught with its quantity of *Farina*, and these *Stamina* are close bound upon the *Brusb*, which is observable at the end of that *Tube*, which here also leads directly to the *Pod* ; It stands not upright indeed, but so bended as to make near a right angle with it.

In *Roses* there stands a *Column*, consisting of many *Tubes* closely clung together, tho easily separable, each leading to their particular Cell, the *Stamina* in a great number planted all round about. In *Tithymalus*, or *Spurge*, there rises a *Tricoccus* Vessel, that whilst it is small and not easily discernible, lyes at the bottom till 'tis impregnated, but afterwards grows up, and stands so high upon a tall *Pedicle* of its own, as would tempt one to think that there were to be no communion betwixt this and the *Apices*, which he sees dying below.

In *Straw-berries* and *Ras-berries*, the hairs which grow upon the ripe fruit (which I suppose may be surprizing to some) are so many *Tubes* leading each to their particular Seed, and therefore we may observe, that in the first opening of the Flower there stands a ring of *Stamina* within the *Petala*, and the whole inward *Area* appears like a little Wood of these Hairs or Pulp, which when they have received and convey'd their *Globules*, the Seeds swell and rise in a carneous Pulp.

I have observed, and can deduce the contrivance and administration of the parts in all the Plants I have observed, and I doubt not but if those Gentlemen whose penetration and leisure is greater than mine, shall think fit to apply their thoughts to this subject, they will be able to perfect what I have rudely hinted, and from this Theory when some such able hand shall have done it Justice, many Corol-

rollaries may be derived, which will let in light into many parts of Natural Philosophy. I shall content my self at present with suggesting, that hence one would conclude that the *Petala* of the Flower were rather design'd to sever superfluous Juices from what was left to ascend in the *Stamina*, then the *Stamina* to perform this office, either for them, or the unimpregnated *Semina*. And observe the Analogy between *Animal* and *Vegetable* Generation, as far as was necessary there should be an agreement between 'em.

The Explication of the Figures.

Figure the 23 represents a yellow Lilly. A. the top of the *Pistillum* or Tube, at which the Seminal Plants are suppos'd to enter, and thro which they are convey'd to the unimpregnated Seed in the Seed Vessel.

b b b b b b. The *Apices Seminiformes*, which when they are ripe open, and shed that Powder which enters the Tube at A.

C. The place of the Seed Vessel at the bottom of the Tube, the Seed Vessel itself being conceal'd under the Leaf in this Draught.

Figure the 24th. D. The *Siliqua* in a Flower of the Pea-kind.

E. The Tube which arises from the *Siliqua*, and conveys the Plants to it.

F. The Membranous Coat that involves the *Siliqua* laid open.

g g g g g g. The *Apices*, which before the Membranous tegument is laid open, appear to rise from its edges, and by the *Petala* of the Flower are kept close upon the Orifice of the Tube, that they may conveniently shed their *Farina* into it.

Figure the 25th. A *French Bean* represented sidewise.

Figure 26. The same open'd.

h. The Seminal Plant.

i. A Perforation, at which, 'tis suppos'd, the Seminal Plant first enter'd.



